

Chapter 27 – Construction Safety Management (REDACTED)

27.1 Purpose

The NASA Ames Research Center (ARC) Health and Safety Manual contains a number of chapters that address NASA policies and specific topics. The purpose of this chapter is to provide construction safety requirements and define responsibilities for personnel employed by or working at ARC. This chapter also defines responsibilities and requirements pertaining to construction safety for contractors and subcontractors who conduct construction-related activities on ARC property.

27.2 Applicability

This manual is applicable to: (1) all Ames Employees; and (2) all persons and entities who agree in writing to comply with this manual.

27.3 Authority and References

ARC adheres to and enforces this policy and all applicable Federal, State, and local governing regulatory agency regulations and guidelines that pertain to construction safety activities, including but not limited to:

1. Code of Federal Regulations (CFR)
 - 29 CFR 1910, Occupational Safety and Health Standards
 - 29 CFR 1926, Safety and Health Regulations for Construction
 - 10 CFR 34, Licenses for Radiography and Radiation Safety Requirements for Radiographic Operations
 - 10 CFR 150, Exemptions and Continued Regulatory Authority in Agreement States and in Offshore Waters under Section 274 (Recognition of Agreement State licenses)
2. California Code of Regulations (CCR)
 - 8 CCR Div. 1, Ch. 4, Division of Industrial Safety
3. National Fire Protection Association (NFPA)
 - NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, 1996 edition
4. Military Standards
 - MIL-STD-271, Requirements for Nondestructive Testing Methods

27.4 Definitions

1. **Code of Safe Practices:** A written safety procedures which relates to the Employer's operations. The code shall contain language pertinent to the relevant parts of the operation that would effect the employee's safety.
2. **Competent Person:** An individual who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or

dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

3. **Construction Contractor:** A business entity (i.e., person, corporation, partnership, joint venture, etc.) which has satisfied the contracting officer that they qualify as one of the following:
 - They own, operate, or maintain a place of business regularly engaged in the construction, alteration, or repair of buildings, structures, communication facilities, or other engineering projects, including furnishing and installing of the necessary equipment; or
 - If currently entering into a construction activity, they have made all necessary prior arrangements for personnel, construction equipment, and required licenses to perform construction work.
4. **Construction Permit:** An Ames document (ARC 57) that approves construction plans prior to construction activities.
5. **Construction Safety Specialist:** A Safety Division representative who provides professional health and safety services to enhance health and safety on all NASA construction projects. The activities of the Construction Safety Specialist include performing site surveys, reviewing construction permits, and rendering technical advice and assistance to Project Managers. To maintain complete objectivity in this monitorial role, the Construction Safety Specialist reports directly to the Safety Division.
6. **Construction Work:** For purposes of this section, construction work means work for construction, alteration, and/or repair, including painting and decorating of a structure.
7. **Contracting Officer:** Any person who, by appointment in accordance with procedures prescribed by the Federal Acquisition Regulations and NASA FAR Supplement, is currently a contracting officer with the authority to enter into contracts, administer contracts, and make determinations and findings with respect thereto or with any part of such authority. The term also includes their authorized representative, Contracting Officer's Technical Representative (COTR), who acts within the limits of the Contracting Officer's authority.
8. **COTR:** An acronym for Contracting Officer's Technical Representative. See definition under Contracting Officer.
9. **Demolition:** Any operation that involves the intentional burning, wrecking, or taking out of any load-supporting structural members of a facility.
10. **Hot Work Permit:** Written permission granted by a designated Hot Work Permit (HWP) issuing authority to burn, weld, braze, cut, set off, or launch pyrotechnic displays, detonate, or initiate any other spark or flame-producing process. The completed issued HWP must contain all information and requirements for the requestor to comply with prior to performing hot work (Included as section 27.5, see AHB 1700.1 Chapter 20, Fire Protection, for additional information).
11. **Jobsite Safety Representative:** A person designated by the Contractor to be onsite during all activities. This individual shall have received, at a minimum, 8 hours of supervisor safety and environmental awareness training. Other examples of acceptable training are a 10-hour or 30-hour Occupational Safety and Health Administration (OSHA) provided safety training or a degree/certificate in a safety and health college-level curriculum.
12. **Moffett Field Fire Department:** The on site fire department that provides first responder support in case of fire or related emergencies. The fire department supports fire-related emergencies at construction sites and hot work concerns.
13. **Repair:** Facility work required to restore a facility or component thereof, including collateral equipment, to a condition substantially equivalent to its originally intended and designed

capacity, efficiency, or capability. It includes the substantially equivalent replacement of utility systems and collateral equipment necessitated by incipient or actual breakdown.

14. **Safety Plan:** A non-generic Health and Safety Plan. This plan must be submitted prior to the start of any construction-related work. The plan must specifically call out all hazards associated with the project. The plan must include all safety precautions and training appropriate and specifically to complete the work. Together ARC Construction Safety Specialist and COTR must approve this plan before any construction-related work begins.
15. **Unsafe or Unhealthy Condition:** A condition that could be potentially hazardous to the health and safety of personnel or the public, and/or damaging to equipment, machinery, or the environment.

27.4 Responsibility

All persons who manage, perform, and provide support for construction or maintenance projects located on NASA property shall conduct operations in compliance with the requirements identified in this chapter and all applicable governing regulatory agency regulations and guidelines pertaining to safety in construction.

27.4.1 Safety Division

1. Provide construction safety oversight for construction and/or maintenance projects. Under certain circumstances, this service will be implemented on a budget reimbursable basis to the Center.
2. Provide Certified Asbestos Consultants for assessment and oversight of projects including maintenance activities that pose a potential or actual disturbance of materials that contain asbestos.
3. Provide Certified Lead personnel for assessment and oversight of projects, including maintenance activities that pose a potential or actual disturbance of materials containing lead.
4. Provide updates and information on construction safety regulatory changes to ARC, evaluate, and minimize their impact to the Center.
5. Ensure a thorough review and evaluation of all building permits prior to the start of construction projects.
6. Ensure a thorough review and evaluation of Contractor Safety Plans and all associated documentation prior to the start of construction projects.
7. Provide evaluation services for hot work and issue Hot Work Permits (sample form included as Section 27.5).
8. Support construction-related mishap investigations.
9. Accompany all regulatory agency personnel, including OSHA inspectors, on all visits to construction sites.
10. Maintain a central location for all construction safety management documentation.

27.4.2 Construction Safety Specialist

1. Review contractor safety plan Code of Safe Practices and associated documentation submitted to the COTR. Approve the safety plans as is, approve with comments, or reject the plans with comments before work commences.
2. Monitor compliance to NASA policies and all applicable governing regulatory agency laws and guidelines that pertain to construction safety.

3. Act as ARC primary health and safety contact for inspection and compliance pertaining to construction-related work activities.
4. Utilize ARC safety resources as needed to fulfill safety responsibilities; e.g., fire protection, electrical safety, or industrial hygiene.
5. Attend preconstruction meetings, provide project-specific guidance, and communicate safety expectations to the COTR and Contractor personnel.
6. Review Contractor documentation on contractor-required "Weekly Tailgate Meeting" health and safety meetings and provide support.
7. Strive to conduct daily inspections on all construction projects, including applicable maintenance operations, and document these inspections. Notify the Contractor of any identified safety and health deficiencies. Document deficiencies that cannot be immediately corrected.
8. Should a documented deficiency not be resolved in a reasonable amount of time, an Unsafe Condition Noncompliance will be completed and submitted to the NASA COTR and Contracting Officer (sample format included as Section 27.6).
9. Should any deficiencies pose an imminent health and/or safety hazard, a Stop Work Order Notice shall be issued to the Contracting Officer, the COTR, and the Safety Division Manager (sample format included as Section 27.7).
10. Maintain copies of all construction project documentation in the Safety Division Construction Health and Safety Program project files.
11. Evaluate and issue Hot Work Permits.
12. Support construction-related mishap investigations per requirements outlined in Chapter 4, of APG 1700-1, Mishap Reporting.

27.4.3 Contracting Officer's Technical Representatives (COTRs)

1. Submit contractor safety plans and all associated documentation to the Construction Health and Safety group for review. Ensure that the "Construction Permit Transmittal" is not issued until a Construction Safety Specialist in the appropriate field (i.e., Fire, Safety, etc.) approves the safety plan.
2. Ensure that a survey to determine the presence, location, and quantity of asbestos and/or lead-containing materials has been conducted prior to any work performance if applicable (See APG 1700.1 Chapter 30, Asbestos Management Plan, and/or Chapter 35, Lead Management Plan, for additional information).
3. Ensure that all construction-related work activities are conducted in accordance with NASA policies and all applicable regulations that pertain to construction safety.
4. Coordinate with the Safety Division to ensure that a Construction Safety Specialist monitors construction-related work or maintenance activities.
5. Provide notification to all affected building occupants before any construction work begins in occupied buildings.
6. Conduct weekly job-site safety inspections and document the inspections utilizing NASA-ARC QH Form 107, Construction Safety Weekly Inspection (included as Section 27.8).
7. Ensure that a Construction Safety Specialist participates, as needed, in pre-construction and weekly progress meetings.
8. Ensure that any hazardous waste manifest(s) are signed only by NASA Code QE and/or the Safety Division-designated personnel.

9. Coordinate confined-space activities as required in the Ames Health and Safety Manual APG 1700.1, Chapter 26.
10. Cultivate a communication partnership with (ARC) Construction Safety and Health Specialist.

27.4.4 Construction Contractors

1. Comply with the provisions of the approved construction safety plan and associated documentation and NASA Specification Section 01411, General Safety Requirements (included as Section 27.9).
2. Exercise supervisory authority over all work covered by this chapter. As supervisor of the entire project, the Contractor shall comply and require all subcontractors to comply with NASA policies and all applicable regulations that pertain to construction and safety.
3. Familiarize themselves with NASA-specific policies, understand the contents and definitions utilized, and adhere to all NASA policies that pertain to the scope of work.
4. Ensure that all employees are competent and trained or appropriately certified for the activities they are conducting.
5. Ensure that all employees are fully aware of the hazards associated with the project.
6. Ensure that the contractor or subcontractor who created or controls the hazard immediately abates health and safety hazards at the worksite.
7. Notify the COTR immediately upon discovery of any health and safety deficiency that the contractor cannot resolve.
8. Notify the COTR immediately upon discovery of an inspection by regulatory agency personnel, including OSHA.
9. Ensure that no deviations from the approved health and safety plan occur without prior consent of the Safety Division and the COTR. Change will be reflected in writing and include in the revised Safety Plan.

27.4.5 Code JA, Acquisition Division

1. Require that all construction contracts include a copy of NASA Specification Section 01411, General Safety Requirements (included as Section 27.9).
2. Invoke the "Suspension of Work" provision of the contract should the Contractor or subcontractors refuse or fail to ensure prompt corrective action of safety deficiencies.

27.4.6 The ARC Health Unit

1. Upon request, provide emergency medical treatment to construction workers who have experienced an acute injury or illness while working on ARC property.

27.5 Hot Work Permit

Moffett Federal Airfield Hot Work Permit (Welding, Cutting, Burning, Brazing or Debonation)			1. Permit Number:
2. Date Permit Issued: / /	3. Time Permit Issued:	4. Expiration Date: / / Expiration Time:	
5. Building No.		Room Number:	
6. Outside Area/Location:			
7. Name of Person and Company/Organization Requesting Permit:			
8. Operation to be performed:			
9. <input type="checkbox"/> Fire watch is required during operation and for a period of 30 minutes after completion of operation.			
10. <input type="checkbox"/> A Closure Inspection Is Required. Call _____ at REDACTED after completion of this operation and remain in the area until the arrival of the inspector.			
11. SPECIAL PRECAUTIONS: (10a) Additional work at locations not specifically listed on this permit is strictly prohibited until further inspections are made. (10b) Approved type and size of fire extinguisher or fire hose must be immediately available for use. (10c) All concerned workers and fire watches must be made aware of the location of the nearest fire alarm box and telephone. (10d) Adequate protective covering and shields must be provided to protect adjacent materials and areas from flying sparks or hot slag. (10e) If buildings or areas are equipped with smoke or flame sensing detectors, the alarm techs must be notified prior to commencing work REDACTED (10f) <u>This permit does not authorize Confined Space work.</u> (10g) Dial 911 to report any fire or emergency. (Dial REDACTED from Cell or Pay Phones) (10h) (10i)			
(See reverse side for additional requirements)			
12. The location where the above operation is to be performed has been examined, and necessary precautions taken to provide a fire safe environment. Permission is granted to perform this operation. Signature Of HWP Issuer/Inspector issuing this permit:			
13. I am fully qualified to perform this operation and understand my responsibilities regarding fire safety on this operation, and will apply and abide by the precautions outlined in Section 10 of this permit. Signature of Official-in-Charge or Designated Representative performing Hot Work:			
14. <input type="checkbox"/> Official-in-Charge or Designated Representative of Permit Holder has declared the area safe.			
15. Permit Closed. Signature of HWP Issuer/Inspector:		DATE: / /	TIME:

27.6 Unsafe Condition Noncompliance Notice

This notice may be delivered electronically to the NASA Project Manager and Contracting Officer:

To: (COTR and Contracting Officer)
From: (Construction Safety Specialist)
Subject: Notice of Unsafe Condition Noncompliance

The construction contractor currently working at (Building No.) has failed to resolve safety deficiencies as requested by our office. As a member of NASA's Safety Management Team for this project, please ensure that measures are taken immediately to correct the deficiencies.

(Description of job-site deficiencies)

Should you have any questions or concerns, please contact me at (extension no.).

(Name of Construction Safety Specialist)

27.7 Stop Work Order Notice

This notice may be delivered personally or electronically to the COTR, Contracting Officer, and the Safety Office Manager

To: (COTR, Contracting Officer and the Safety Office Manager)
From: (Construction Safety Specialist)
Subject: Stop Work Order Notice

A safety inspection was conducted at (Building No.) and has identified immediate concerns for people's safety, health, and/or the environment. The construction contractor currently working at (Building No.) has failed to take prompt corrective action of serious unsafe conditions. Please invoke the Suspension of Work provision of the contract and ensure that measures are taken immediately to correct the deficiencies. The Safety Division will not authorize work to resume until appropriate abatement measures are taken.

(Description of unsafe condition)

Should you have any questions or concerns, please contact me at (extension no.).

(Name of Construction Safety Specialist)

27.8 Construction Safety Weekly Inspection Form

NASA Construction Project Manager					Org. Code:				
Name (print):									
Bldg./Location:				Ext.:	Date:				
Program Administration	Yes	No	N/A	Fixed (Date)	Material Storage/Handling	Yes	No	N/A	Fixed (Date)
OSHA Posting					Material Property Stored/Stacked				
Emergency Numbers/Contacts Posted					Dust Protection Adequate				
Hazard Communication Program					Loads Lifted Correctly				
Daily/Weekly Safety Meetings Held					Excavation & Shoring				
Housekeeping/Sanitation					Shoring Proper for Soil & Depth				
Work Areas Orderly					Adjacent Structures Properly Shored				
Adequate Lighting					Necessary Ladders Provided				
Handwashing/Toilet Facilities					Excavation Barricaded				
Passageway & Walkways Clear					Spoil Setback at Least 2 Feet				
Clean Eating/Drinking Area					Equipment Away from Edge				
Fire Prevention					Equipment Ramps Adequate				
Fire Extinguishers Available					Ladders				
Correct Extinguishers for Job					Ladders in Good Condition				
No Smoking Posted & Enforced					Side-Rails Extend 36" above Landing				
Electrical/Utility					Proper for Job & Secure				
Electrical Hazards Posted					Ladders Fully Open when in Use				
Drop Cords Protected					Scaffolding				
Underground Electrical Lines Staked					Equipment in Good Condition				
Lockout Procedures Utilized					Scaffold Is Tied to Structure				
Access to Breaker Box Clear					Guardrails, Top, Mid, Toe Boards in Place				
Underground Gas Lines Staked					Connections Sound & Secure				
Hand & Power Tools					Planking Cleats in Place				
Hand Tools in Good Working Condition					Worker Protection from Falling Objects				
Cords in Good Condition					Welding & Cutting				
All Mechanical Safeguards in Use					Screen & Shields in Place				
Proper Tools Utilized for Each Job					Electrical Equipment Grounded				
Tools Grounded or Double Insulated					Compressed Gas Cylinders Secure/Upright				
Heavy Equipment					Proper Personnel Protection Utilized				
Operation Manuals Available					Fire Extinguishers Immediately Available				
Brakes, Lights, Signals, & Alarms Operative					Welding Cables in Good Condition				
Wheels Choked when Necessary					Personal Protection Equipment				
Seat Belts Worn					Hardhats Worn				
Daily Inspections Documented					Gloves Available				
Barricades & Fencing					Steel Toe Footwear				
Site Fenced					Eye Protection Utilized				
Roadways & Sidewalks Protected					Ear Protection Utilized				
Floor Openings Planked Or Barricaded					Safety Belts & Lanyards Utilized				
Access/Traffic Controlled					Respirators & Masks Utilized				

27.9 NASA Specification Section 01411, General Safety Requirements

27.9.1 Summary

The requirements of this section apply to, and are a component part of, each section of this specification.

27.9.2 References

The publications listed below form a part of this section to the extent referenced:

- 29 CFR 1910, 1998, Department of Labor, Occupational Safety and Health Standards
- 29 CFR 1926, 1998, Department of Labor, Safety and Health Regulations for Construction
- 10 CFR 34, 1998, Licenses for Radiography and Radiation Safety Requirements for Radiographic Operations
- 10 CFR 150, 1998, Exemptions and Continued Regulatory Authority in Agreement States and in Offshore Waters under Section 274 (Recognition of Agreement State licenses)
- 8 CCR Div 1, Ch. 4, California Code of Regulations (CCR), Division of Industrial Safety
- NFPA 241, 1996, National Fire Protection Association (NFPA), Standard for Safeguarding Construction, Alteration, and Demolition Operations NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
- MIL-STD-271, Requirements for Non destructive Testing Methods
- AHB 1700.1, Ames Health and Safety Manual (Available on the Internet at <http://dq.arc.nasa.gov>)

27.9.3 Submittals

The following shall be submitted in accordance with Section 01330, "Submittals," in sufficient detail to show full compliance with the specification: SD-08 Statements

- Documentation shall be submitted for the Safety Plan of paragraph 1.3.1.
- Documentation shall be submitted for Code of Safe Practices of paragraph 1.3.2.
- Designation of Jobsite Safety Representative(s) and evidence of training or certification required in paragraph 1.3.3.

SD-13 Certificates

- License Certificates for Radiation Materials and Equipment shall be submitted.

SD-18 Records

- Jobsite inspections, every morning prior to the start of work (reference paragraph 1.3.4).
- Tailgate Meetings, every week (reference paragraph 1.3.5).
- Accident Reports and Records, as required (reference paragraph 1.3.6).

27.9.3.1 Safety Plan

The contractor shall submit a Safety Plan to the contracting officer for approval within 30 days after contract award. The notice to proceed will not be given until the Safety Plan is approved.

The Safety Plan shall apply to all contractor and subcontractor operations, and shall have 8 elements. Each element shall be described in a separate section in the written document. The elements are as follows:

1. **Responsibility:** Identify the person or persons with authority and responsibility for implementing the program.
2. **Compliance:** Establish a system for ensuring that employees and subcontractors comply with safe and healthy work practices.
3. **Communication:** Establish a system for communicating with employees and subcontractors on matters relating to safety and health, including provisions designed to

encourage employees to inform the employer of hazards at the worksite without fear of reprisal.

4. **Hazard Assessment** (Including Checklists): Establish procedures for identifying and evaluating workplace hazards including scheduled routine inspections to identify unsafe conditions and work practices. Inspections shall be made to identify hazards.
5. **Accident/Exposure Investigation:** Establish a procedure to investigate occupational injury or occupational illness.
6. **Hazard Correction:** Establish methods and/or procedures for correcting unsafe or unhealthy conditions, work practices and work procedures in a timely manner based on the severity of the hazard: a) when observed or discovered, and b) when an imminent hazard exists which cannot be immediately abated without endangering employees and/or property, remove all exposed personnel from the area except those necessary to correct the existing condition. Employees necessary to correct the hazardous condition shall be provided the necessary safeguards. Document correction has been made.
7. **Training:** Establish training programs a) for new employees, b) for employees given new job assignments for which training has not been previously received, c) whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard, d) whenever the employer is made aware of a new or previously unrecognized hazard, and e) For supervisors to familiarize themselves with the safety and health hazards to which employees under their immediate direction and control may be exposed. Document all training.
8. **Record keeping:** Maintain records of scheduled and periodic inspections, safety meetings, and training records. Records shall be maintained at the jobsite, accessible to the NASA's Construction Safety Specialist, and retained for at least one year.

The Hazard Assessment section shall address specific hazards that are anticipated in this project. Competent persons, where required, shall be listed in the appropriate category. Qualifications of the competent person, including experience and training shall be provided. Checklists shall be submitted and used on daily jobsite inspections to ensure that work is performed in a safe manner. The following hazards and programs shall be addressed if applicable (the list is not all-inclusive):

1. Trenching and Excavation
2. Fall Protection
3. Crane and Rigging Operations
4. Power and Hand Tools
5. Ergonomic Hazards
6. Safe Access to Work Areas
7. Electrical Hazards
8. Lockout/Tagout, including training and authorization records and proposed procedures
9. Hazardous Chemical Exposure
10. Confined Space, including proposed procedures
11. Asbestos
12. Lead
13. Hazard Communication, including training and MSDS location
14. Respiratory Protection

15. Hazard Assessment for Personal Protective Equipment
16. Hearing Conservation
17. Scaffolding
18. Radiation Operations
19. Exposed rebar
20. Roofing Operations
21. Personnel Protective Equipment for all operations

An Injury and Illness Prevention Program as required by the State of California meeting the requirements of 8 CCR 1509 and 8 CCR 3203 will be accepted if the Hazard Assessment section is completed as described above, and if the Safety Plan is site specific, not a generic plan.

22. Code of Safe Practices

The contractor shall adopt a written Code of Safe Practices, which relates to the Contractor's operations. A Code of Safe Practices as required by the State of California containing language equivalent to the relevant parts of 8 CCR 1509, Appendix Plate A-3 will meet the requirement of this paragraph. It shall be posted at a conspicuous location at the jobsite office, or be provided to each supervisory employee who shall have it readily available. The code shall relate to the Employer's operations. Employee shall be given instructions regarding the hazards and safety precautions applicable to the type of work in question and directed to read the Code of Safe Practices.

27.9.3.2 Jobsite Safety Representative

The Contractor shall designate a person(s) as a Jobsite Safety Representative to be on-site during all times when work is being performed. The person shall have received a minimum of 8 hours of supervisor safety and environmental awareness training. An example of an acceptable 8 hour supervisor training course is the one sanctioned by the Pacific Industry and Business Association (PIBA). Other examples of acceptable training or certifications are a 10 or 30 hour OSHA provided safety training, or a certification in a safety and health college level curriculum (e.g., University of California Safety and Health certification program)

The Jobsite Safety Representative shall perform the following duties:

1. Perform daily jobsite inspections and complete checklists.
2. Possess authority to take corrective action measures to abate safety violations.
3. Provide to the Contracting Officer Technical Representative (COTR) upon request training records required by the Safety Plan. Records include meetings of supervisory employees, tailgate safety meetings, jobsite inspections, employee safety orientation and knowledge of Code of Safe Practices, equipment and machinery training, and training in special known and suspected hazards such as chemicals, noise, lockout/tagout, confined space, lead and asbestos etc.

Failure to have a trained Safety Representative present on the jobsite when work is performed, is considered a Non Compliant condition, and subject to the provisions of Section 1.6 below.

27.9.3.3 Jobsite Inspections

The Contractor shall conduct jobsite inspections and complete checklists at least every day, as required in the Hazard Assessment section of the Safety Plan as described in 1.3.1 above.

27.9.3.4 Tailgate Safety Meetings

Each Contractor and subcontractor working on the site shall conduct toolbox safety meetings with their crews at least every 2 weeks to emphasize safety.

27.9.3.5 Accident Reports & Records

The Contractor shall immediately make an oral report to the Contracting Officer of any accident that results in one of the following: a) fatality, b) disabling or lost time injury, c) injury requiring medical treatment, d) property contamination, or e) Contractor property loss of \$10,000 or more and NASA property loss/damage over \$1,000. A written report shall be submitted to the Contracting Officer, and a separate copy to the Safety Division at Mailstop [REDACTED], within 24 hours of each incident. The report shall include investigative findings (but is not required to include an expression of opinion as to the negligence or fault of any employee), and proposed or completed corrective actions.

27.9.4 General Safety Provisions

The Contractor is responsible for taking adequate safety and health measures to ensure a safe, healthy environment for the Contractor's employees, and those of any subcontractors. The Contractor shall take all necessary precautions to prevent injury to the public, building occupants, or damage to property of others. For the purposes of this contract, the public or building occupants shall include all persons not employed by the Contractor or a subcontractor.

27.9.5 NASA Safety Inspections

The Contractor's operations are always subject to inspection by the NASA's Construction Safety Specialist. The Contractor shall comply with reasonable requests of these individuals, as it relates to safety. If the Contractor believes any request to be outside the scope of the contract, the Contracting Officer shall immediately be notified of this fact. The Contracting Officer will make a determination on the issue, and give appropriate direction to the Contractor.

27.9.6 Non Compliance

The Contracting Officer may, at any time, notify the Contractor, in writing, of any non-compliance with the provisions of this section, and may specify corrective actions to be taken. The Contractor shall, upon receipt of such notice, immediately take corrective action. If the Contractor fails or refuses to take prompt corrective action, the Contracting Officer may invoke the "Suspension of Work" provision of the contract, may contact the Contractor's insurance carrier, and/or may invoke whatever other rights are available to the Government under the terms and conditions of this contract, to remedy such failure or refusal.

27.9.7 First Aid Facilities

The Contractor may use the NASA Ames Health Unit for first aid emergency health services during normal business hours (8 am- 4:30. The NASA Ames Health Unit is located on the west end of [REDACTED], across the street from the [REDACTED].

27.9.8 Reporting Emergencies

All Contractor and sub-contractor personnel shall be instructed to report all emergencies by calling the NASA Dispatch Office at 911 on Government phones, or [REDACTED] on cellular phones, pay phones or private phone lines. (Dialing 911 on cellular phones, pay phones or private phone lines will call the City of Mountain View, and delay response.) The Contractor shall post emergency phone numbers at the jobsite.

27.9.9 Construction Trailers

Construction trailers or other temporary buildings brought onto the site shall be separated from NASA Buildings in accordance with Table 2-1.1 of NFPA 241, but in no case shall the distance be less than 9 meters (30 feet).

27.9.10 Shut Down of Fire Sprinkler Systems

48 hours in advance of a proposed fire sprinkler system shutdown, the Contractor shall notify the Contracting Officer Technical Representative (COTR), who will arrange for local maintenance personnel to perform the shut down, and make the required notifications. The Contractor shall provide a schedule of what sections of the system are required to be shut down, and for how long. Verification that system function properly once brought back on-line shall take place systematically.

Fire sprinkler systems shall be turned back on before the end of a working shift unless the Contractor receives permission from the Contracting Officer and provides a person to tour the building as an on-site fire watch during all NASA non-business hours.

27.9.11 Shutdown of Fire Alarm Systems

48 hours in advance of a proposed fire alarm system modification, the Contractor shall notify Contracting Officer Technical Representative (COTR). The COTR will arrange for local maintenance personnel to perform the shut down, disconnect the affected circuits from the fire alarm panel if required and make the required notifications. The Contractor shall restore the affected circuits to normal condition before the end of each working shift, and arrange with the COTR to restore the fire alarm panel to normal operating condition.

27.9.12 Welding, Cutting and Burning

A signed hot work permit is required 24 hours in advance of any welding, cutting, or burning operations. The permit will not be issued until:

1. It has been determined that the work can be safely conducted at the desired location.
2. Combustibles have been moved away or covered by an approved tarpaulin.

The atmosphere is nonflammable.

Precautions have been taken so that building fire detection and suppression systems will not be adversely affected.

If required by the permit issuer, provide a fire watch (with dedicated extinguisher) for the duration of the work and for 30 minutes thereafter (60 minutes for torch-applied roofing operations) to ensure that sparks or drops of hot metal do not start fires. All cracks and openings in floors shall be safely covered or closed.

The permit shall be requested by contacting the NASA Safety Division at REDACTED.

27.9.13 Excavation Permits

A signed excavation permit is required 24 hours in advance of any excavation or trench work exceeding 6 inches in depth. The permit will not be issued until the existence and location of underground pipes and electrical conductors have been determined.

The permit shall be requested by directly contacting the Contracting Officer Technical Representative (COTR).

27.9.14 Confined Space

Work in confined spaces must meet the requirements of 29 CFR 1910.146, 8 CCR 5156 and the NASA Ames program outlined in the Ames Health and Safety Manual APG 1700.1, Chapter 26.

In accordance with APG 1700.1, Chapter 26, the Contractor shall:

1. Ensure their employees and subcontractors comply with all procedures in APG 1700.1, Chapter 26.
2. Obtain any available information regarding permit space hazards and entry operations from the Contracting Officer Technical Representative (COTR).
3. Coordinate entry operations with the COTR, when both NASA personnel and contractor personnel will be working in or near permit spaces.
4. Develop and implement procedures to coordinate entry operations when employees of more than one employer are working simultaneously as authorized entrants in a permit space, so that employees of one employer do not endanger the employees of any other employer.
5. Provide a copy to the COTR of the permit space program that the contractor will follow and inform the COTR of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation. This information should be conveyed as often as necessary to keep the COTR informed of the status of confined space entries in their areas.
6. Obtain all equipment, medical monitoring, and training necessary to conduct a safe entry including ventilation, rescue and calibrated monitoring equipment.
7. Provide documentation/verification of training to COTR, prior to start of work.

There are approximately 760 permit required confined spaces at NASA Ames (660 exterior locations such as manholes and vaults, and 110 interior locations). The locations are identified with signs.

Procedures and training specific to NASA Ames shall be included in the Safety Plan described in 1.3.1 above. Chapter 26 of the Ames Health and Safety Manual may be used as a template for the Contractor's program. If the Contractor encounters a confined space that meets the definition of a permit required confined space, and it has not been so identified, the COTR shall be notified prior to proceeding with the work.

8. Provide a copy of all non-permit, alternate entry, and Permit forms to COTR at the completion of every entry.

27.9.15 Lockout/Tagout

For the protection of both NASA Ames and Contractor personnel, the Contractor's Lockout/Tagout (LOTO) program shall be consistent with the NASA Ames program outlined in the Ames Health and Safety Manual APG 1700.1, Chapter 31. Where LOTO procedures are required, the contractor shall include as part of the Safety Plan submittal, a copy of the proposed LOTO procedures. Contractors are responsible for ensuring that their employees have been properly trained, and shall submit training records to the COTR. Regardless of whether or not they will perform LOTO, all Contractor employees that have potential exposure to NASA or Contractor LOTO activities, shall be trained in the recognition of the procedure and the importance of respecting locks and tags.

Contractor personnel may take periodic NASA provided LOTO training on a space available basis. The NASA Safety Training Office can be contacted at **REDACTED**.

The Contractor shall honor any existing lock or tags. If the Contractor needs to have a lock or tag removed, the COTR shall be notified. The COTR will coordinate the request with the appropriate NASA organization.

27.9.16 Radiation

The use of radioactive material sources, ionizing radiation producing machines particle accelerators or Class b or 4 lasers for industrial radiographic inspections or construction

activities shall not be allowed on Ames Research Center property unless the NASA Ames Radiation Safety Office has reviewed and approved the procedures to be used.

The NASA Ames Research Center is a Federal site, under the jurisdiction of the Nuclear Regulatory Commission (NRC). All non-NRC licensed radiographic companies must obtain and hold a current reciprocity agreement (NRC form 241) in accordance with 10 CFR 150.20 authorizing radiographic activities at the NASA Ames Research Center. Filing for the reciprocity agreement requires a three-day notification prior to commencement of operations and must be renewed annually at the first of each year. A copy of the radiography contractor's current license to conduct radiography and a current copy of its company radiation safety manual shall be kept on file with the NASA Ames Research Center Radiation Safety Office. The Radiation Safety Officer can be reached by dialing [REDACTED].

The Contractor shall conduct radiation operations only under the surveillance of the Contracting Officer, or the COTR. The Contractor shall cause all buildings to be cleared of personnel, conspicuously post the 2mR/hr boundaries, and erect requisite barriers prior to initiation of radiographic procedures, as required by 10 CFR 34.42. All radiographic procedures shall be planned to commence after 5:30 PM and terminate before 5:30 AM unless authorized for alternative hours has been established with the NASA Ames Research Center Radiation Safety Office. During hours of darkness, the signs shall be conspicuously illuminated with an amber or white light.

The Contractor shall maintain direct surveillance of the area at all times that the source is exposed. This will require a minimum of two sets of eyes observing the radiographic boundary at all times the source is exposed to protect against unauthorized entry.

The Contractor shall comply with all radiographic equipment and paperwork requirements identified in 10 CFR 34 and shall maintain a properly, currently calibrated survey meter on site, and conduct periodic monitoring during all radiographic examinations. Failure to comply with these regulations shall result in the Contractor being requested to terminate all work and leave the facility.

The Contractor shall immediately report to the Radiation Safety Officer and the Contracting Officer any radiological health hazard, emergency, or loss of ionizing radiation source at the Center or its alternative sites. Upon completion of radiological operations, the Contractor shall notify the Contracting Officer or the COTR, and after conducting a final radiation survey, shall remove all warning signs and ropes.

Radiographs shall be performed in a manner consistent with 10 CFR 34 and shall be approved by the Contracting Officer or his/her representative. Unless otherwise specified, non-destructive testing shall be in accordance with MIL-STD-271 "Requirements for Non destructive Testing Methods," modified by deletion of all reference to Bureau of Ships and other Navy agencies and substitution of NASA therefore.

27.9.17 Storage

Storing, positioning or use of equipment, tools, materials, scraps and trash in a manner likely to present a hazard to the public or building occupants by its accidental shifting, ignition, or other hazardous qualities is prohibited. Storing of combustible or flammable liquids shall be in accordance with 29 CFR 1926.152 - NFPA Article 80.

27.9.18 Asphalt and Tar Kettles

Asphalt and tar kettles or similar fired equipment shall be located in a safe place outside the building at a point where there is no danger of ignition of combustible materials, and downwind and away from building air intakes. Continuous supervision by the user shall be maintained while such equipment is in operation. Each tar kettle shall be provided with a metal cover and an accurate thermometer located in full view of the operator. Tar kettles shall not be operated at temperatures greater than 218°C or 13.9°C below the ignition point of the material being

used, whichever is less. A fire extinguisher having a rating of at least 20-BC shall be provided within 9 meters of each tar kettle.

27.9.19 Protection of the Public and Federal Employees

Work shall not be performed in any area occupied by the public or Federal employees unless specifically permitted by the contract or Contracting Officer, and unless adequate steps are taken for the protection of the public or Federal employees.

27.9.19.1 Obstructions

No corridor, aisle, stairway, door, or exit shall be obstructed or used in such a manner as to encroach on routes of ingress or egress utilized by the public or building occupant, or to present unsafe or unhealthy condition to the public or building occupant. Access to fire protection panels and equipment shall not be obstructed.

27.9.19.2 Fences and Barricades

Whenever practicable, the work area shall be fenced, barricaded or otherwise blocked off from the public or building occupants to prevent unauthorized entry into the work area. In all cases access to fire hydrants and fire department connections shall be maintained. Fences and barricades shall be removed upon completion of the project, in accordance with local ordinance and to the satisfaction of the COTR and Construction Safety Specialist.

27.9.19.3 Alternate Precautions

When the nature of the work prevents isolation of the work area and the public or building occupants may be in or pass through, under or over the work area, alternate precautions such as the posting of signs, the use of signal persons, the erection of barricades or similar protections around particularly hazardous operations shall be used as appropriate.

27.9.19.4 Public Thoroughfare and Roadways

When work is to be performed over a public thoroughfare such as a sidewalk, lobby, or corridor, the thoroughfare shall be closed, if possible, or other precautions taken such as the installation of screens or barricades. When the exposure to heavy falling objects exists, as during the erection of building walls or during demolition, special protection of the type detailed in 29 CFR 1910 and 1926 shall be provided. If any part of a roadway is blocked or closed off during the construction project, it shall be coordinated with NASA Security and the Moffett Field Fire Department. Flag personnel shall be used when needed to direct traffic that is affected by the construction activity. All open trenches adjacent to sidewalks and roadways shall be properly covered or barricaded for the entire length of the open trench with lighted barricades.

27.9.19.5 Temporary Construction Barriers

Paragraphs 1.20.2 through 1.20.4 above specify the erection of construction barriers in specific situations. Temporary interior construction barriers, partitions which cover a hole in a fire rated wall or separate the construction from public access and exit corridors shall be erected floor-to-ceiling, wall-to-wall and remain in place for the duration of the contract. The minimum construction standards for these temporary barriers shall be metal studs 400 mm on center, anchored top and bottom and covered with a minimum of one layer of 15 mm gypsum wallboard.

27.9.20 Hazardous Materials and Waste

Hazardous materials and hazardous wastes shall be stored, handled and disposed of in accordance with Specification Section 01500, Environmental Compliance and Pollution Prevention.

27.9.21 Asbestos**27.9.21.1.1 New Materials**

The use of materials containing asbestos at this facility is prohibited.

27.9.21.1.2 Encountering Asbestos

All contractors and their employees working around asbestos must have OSHA compliant awareness training. Copies of this certification must be submitted to the CO prior to the contractor commencing with construction. If materials containing asbestos are encountered, work in the area of the ACMs shall be immediately stopped, and the conditions reported to the Contracting Officer.

OR

If materials containing asbestos are expected to be encountered, refer to Section **02080** of the Ames Standard Construction Specification and section 30 of APG 1700.1 for removal, handling and disposal procedures, and requirements.

27.9.22 Lead

All contractors and their employees working around lead must have OSHA compliant awareness training. Copies of this certification must be submitted to the CO prior to the contractor commencing with construction. If lead is encountered, work in the area of the lead shall be immediately stopped, and the conditions reported to the Contracting Officer.

AND/OR

If lead containing material is expected to be encountered, refer to Section **02090** of the Ames Standard Construction Specification and section 35 of APG 1700.1 for removal, handling and disposal procedures and requirements.

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